



The Regional Network Office for Urban Safety (RNUS)

Monthly Report (February 2025)

Report to STE/SET

Prepared by RNUS

Date: 7th March 2025

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1.1 Summary

This report summarizes the activities done in RNUS office during the month of February 2025. Progress has been summarized in the following orders:

- 1) RNUS Outreach Activities
- 2) Progress on Research Activities
 - Satellite-based flood map (support in RIMES's project)
 - Water level measurement with low-cost device for CH4 emission mitigation in Thailand
 - Structural Health Monitoring with remote sensing techniques
 - Study on post-disaster recovery dynamics
 - Study on Development of Land-use Optimization tool
 - Water logging issue in oil palm field (tentative topic)
- 3) Plans

1.2 RNUS Outreach Activities

The first RNUS Seminar Series of 2025 (01/2025) is scheduled to take place on 25th March 2025, 13:00~14:00 Thailand Time, online mode. The speaker of this series has been confirmed as below:

- Prof. Dr. Pornchai Supniti (Telecommunications Engineering Department, Faculty of Engineering, King Mongkut's Institute of Technology Ladkrabang)
Topic: Linear Modeling of PM2.5 from AeroNet ground and Satellite data in Thailand

1.3 Progress on Research Activities

1.3.1 Satellite-based flood map (support in RIMES's project)

No update for this month.

1.3.2 Water level measurement with low-cost device for CH4 emission mitigation in Thailand

The paddy cropping season will begin in early March, during which water level sensors will be placed in both the AWD-applied and AWD-not-applied paddy fields within the RID compound. AWD-Alternate Wetting and Drying. Of the three water level monitoring devices (Manufacturer: Farmo/Japan) installed in the RID paddy field in Nakhon Pathom, one has been malfunctioning since late February. The RNUS team is currently coordinating with the manufacturer for troubleshooting. This device will undergo inspection during a site visit scheduled for March 11, 2025. Meanwhile, the other two devices are functioning properly, and real-time data on water levels and temperatures can be accessed via the dashboard, as illustrated in Fig-1 and Fig-2.



Figure-1. Farmo sensors dashboard configuration (left: Substitute device from manufacturer, middle and right: from RNUS) Middle one is not working properly now.

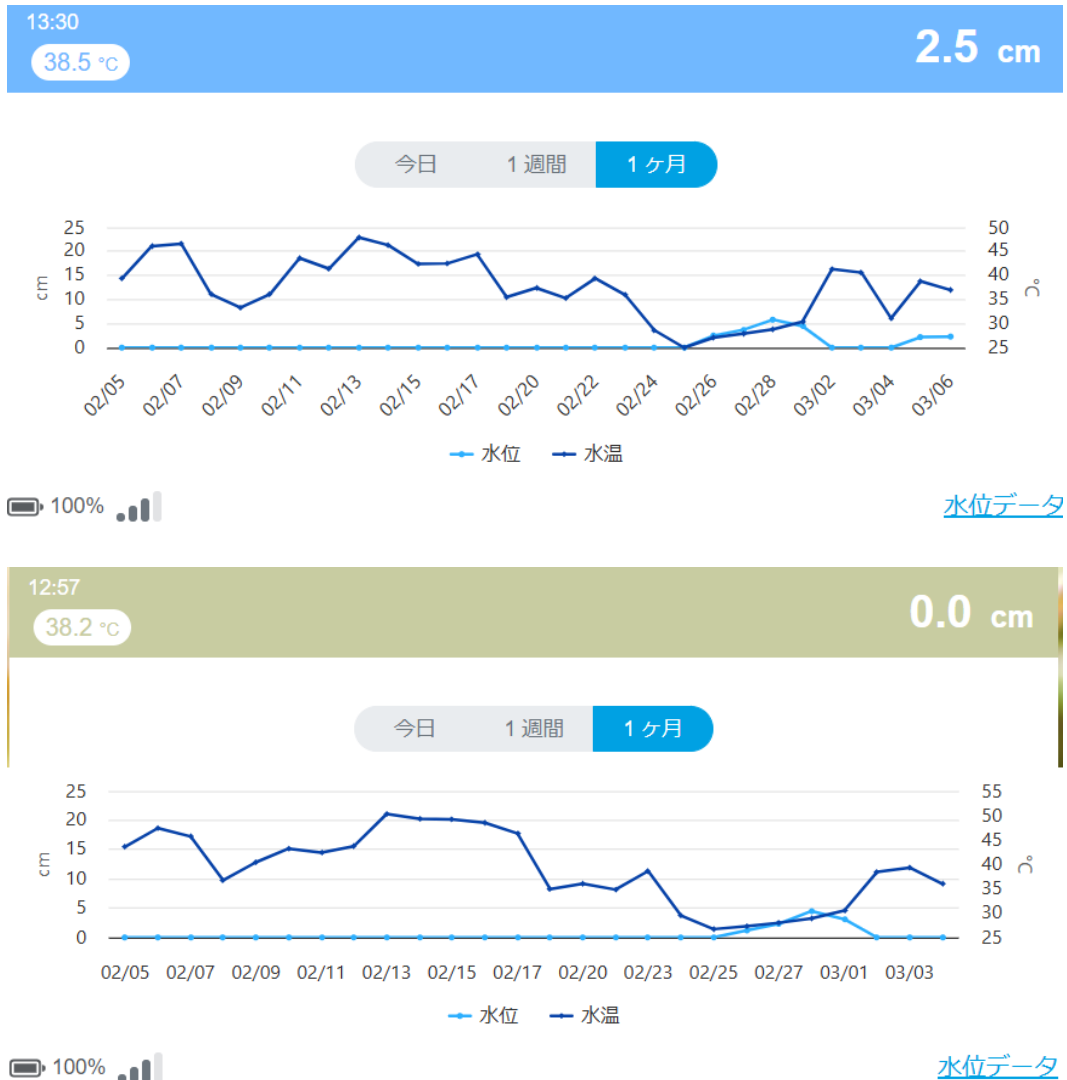


Figure-2. Real-time water level and temperature measurement from two functioning devices installed inside RID paddy field.

Methane emission measurement will be done on March 11, 2025, 2025. Prof. Takeuchi and Khun-Metta will visit to RID paddy field in Nakhon Pathom and will do the measurement. Two closed chambers, procured with RNUS budget from the Ambient Lab at AIT (Fig. 3), will be set up within the RID paddy field for this purpose.



Figure-3. Closed chamber for methane emission measurement.

1.3.3 Structural Health Monitoring with remote sensing techniques

No update for this month.

1.3.4 Study on post-disaster recovery dynamics

Research is underway on the recovery financing model and review research paper. In recent developments, a related subtopic has been put forth due to grant approval (Grant-in-Aid for Scientific Research (A) by JSPS) for which Dr. Yasmin is a Co-I. This topic is on “Transformative Resilience” (Japanese title: 変革する力としてのレジリエンスの定量化に向けた構造解明) which is precisely related to the dynamics of recovery in the sense that it determines the path that a post-disaster recovery may take. Therefore, there will be more related activities in this regard in the coming months.

Current student assistantship status for projects supervised by Dr. Yasmin:

Assistantship Topic	Activities	Hours worked	
		No. of student	hours worked (200thb/hr)
Nepal recovery research	Data collection and programming for financing model development	1	30hrs (January)* 30hrs (February)

*Outstanding timesheets approved (March 7)

1.3.5 Study on Development of Land-use Optimization Tool

Comprehensive plan analysis for the new urban master plan of Phuket is currently underway. We plan to conduct resident and planning agency interviews at the end of March in two regions of Phuket (Bang Tao and Patong) with high risk of tsunami inundation (see table 1 below). Insight from these interviews will allow understanding on the possibility of applying the land-use optimization tool in these and other Thailand regions.

Table 1: Study area characteristics

Characteristic	Bang Tao	Patong
Geographic Location	Coastal area with long beachfront	Highly developed urban coastal area
Historical Background	the largest Muslim ethnic community in Phuket.	Developed as a commercial and tourism hub with rapid urbanization
Tourism Importance	Major tourism area with beachfront developments	Major economic hub, high tourist influx
Economic Transition	Transitioned to tourism after the decline of mining.	Strong reliance on tourism and commercial businesses
Local Fishing	Fishing has been a traditional occupation with a safe harbor from winds and storms.	Limited local fishing activities due to high urbanization and tourism development.
Community & Culture	A strong Muslim ethnic community following traditional religious practices. Known for cultural blending through marriage and migration, shaping a unique local identity.	Diverse urban population with a mix of local and international residents, driven by tourism and business expansion.

1.3.6 Water logging issue in oil palm field (tentative topic)

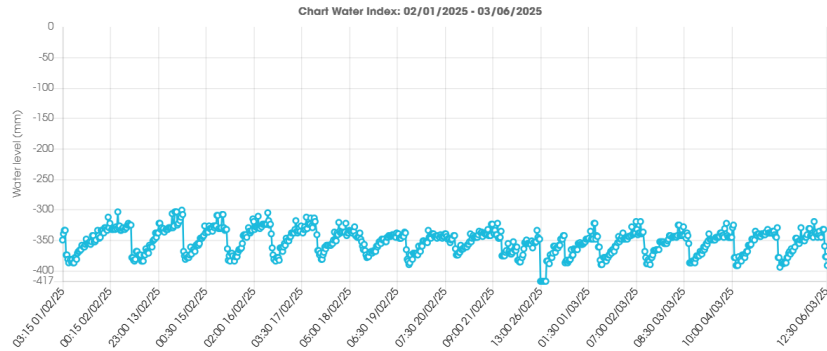
Water level sensors installed inside oil palm field is working well, and the real-time water level data can be accessed instantly through the dashboard, as illustrated in Figure 4. Anomalies in water level measurement needs to be validated with the irrigation activity and will be done accordingly.

1.4 Plans

RNUS Seminar Series (01/2025): 25th March 2025, 13:00~14:00 Thailand Time.

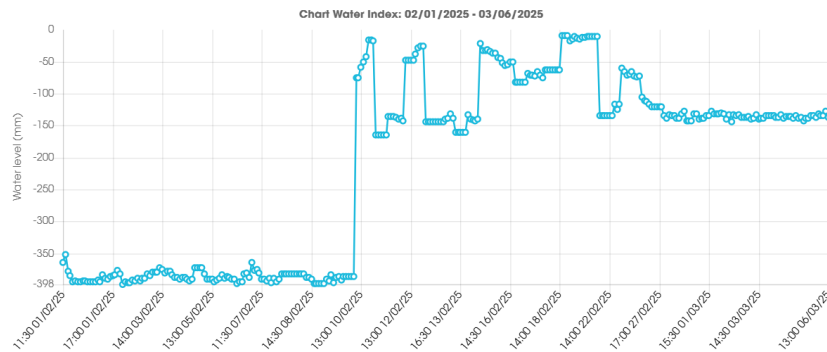
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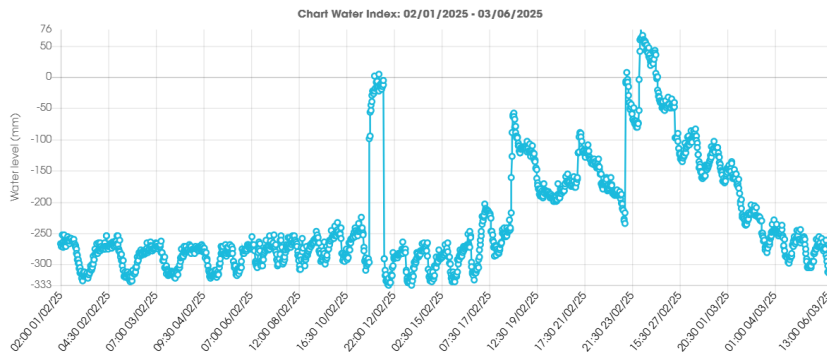


Figure-4. Real-time water level data from Rynan dashboard (sensors installed inside oil palm field in Prachuap Khirikhan, Thailand)